

WHAT IS CLAIMED IS:

1 1. A magnetoresistive head comprising:

2 a lower magnetic shield formed on a substrate;

3 a magnetic domain control underlayer formed on the lower magnetic shield;

4 a multi-layered film having an underlayer formed on the magnetic domain control
5 underlayer, a free layer, a non-magnetic layer, a pinned layer, and an anti-ferromagnetic layer for
6 pinning the magnetizing direction of the pinned layer;

7 a magnetic domain control film formed on the magnetic domain control
8 underlayer, said magnetic domain control film being in contact with both of lateral ends in the
9 direction of the track width of the free layer, for conducting magnetic domain control of the free
10 layer;

11 a pair of electrode films for supplying an electric current to the multi-layered film;

12 and

13 an upper magnetic shield formed on the multi-layered film and the electrode film.

1 2. A magnetoresistive head comprising:

2 a lower magnetic shield formed on a substrate;

3 a magnetic domain control underlayer formed on the lower magnetic shield;

4 a multi-layered film having an underlayer formed on the magnetic domain control
5 underlayer, a free layer, a non-magnetic layer, a pinned layer, and an anti-ferromagnetic layer for
6 pinning the magnetizing direction of the pinned layer;

7 a magnetic domain control film formed on the magnetic domain control
8 underlayer, said magnetic domain control film being in contact with both of lateral ends in the
9 direction of the track width of the free layer, for conducting magnetic domain control of the free
10 layer;

11 a dielectric film formed on the magnetic domain control film; and

12 an upper magnetic shield formed on the multi-layered film and the dielectric film.

1 3. The magnetoresistive head of claim 1 wherein the magnetic domain control

2 underlayer is formed of a non-magnetic material selected from one or more of Cr, Ti, W, Mo, V,
3 Mn, Nb, and Ta.

1 4. The magnetoresistive head of claim 1 wherein a relation between a film
2 thickness of the magnetic domain control underlayer defined as t_{UL} , and a distance between the
3 upper end of the magnetic domain control underlayer and the lowermost portion of the magnetic
4 domain control film defined as OM is: $0 \leq OM \leq t_{UL}$.

1 5. The magnetoresistive head of claim 1 or 2 or 3 or 4 wherein the relation
2 between t_{UL} and OM is: $0.8 \leq OM \leq t_{UL}$ 2.2.

1 6. A method of manufacturing a magnetoresistive head comprising:
2 depositing a lower magnetic shield on a substrate;
3 depositing a magnetic domain control underlayer on the lower magnetic shield;
4 forming, on the magnetic domain control underlayer, a multi-layered film
5 comprising an underlayer, a free layer, a non-magnetic layer, a pinned layer, and an anti-
6 ferromagnetic layer for pinning the magnetizing direction of the pinned layer in one direction;
7 forming a resist layer on a portion of the multi-layered film;
8 removing portions of the multi-layered film and the magnetic domain control
9 underlayer not covered with the resist layer;
10 depositing a magnetic domain control film on the lateral side in the direction of
11 the track width of the multi-layered film and on the magnetic domain control underlayer on both
12 sides thereof;
13 depositing an electrode film on the magnetic domain control film;
14 removing the resist layer; and
15 forming an upper magnetic shield on the electrode film and the multi-layered
16 film.

1 7. The method of manufacturing a magnetoresistive film of claim 6, and further
2 comprising heating the substrate.

1 8. A method of manufacturing a magnetoresistive head comprising:
2 depositing a lower magnetic shield on a substrate;
3 depositing a magnetic domain control underlayer on the lower magnetic shield;

4 forming, on the magnetic domain control underlayer, a multi-layered film
5 comprising an underlayer, a free layer, a non-magnetic layer, a pinned layer, and an anti-
6 ferromagnetic layer for pinning the magnetizing direction of the pinned layer in one direction;
7 forming a resist layer on a portion of the multi-layered film;
8 removing portions of the multi-layered film and the magnetic domain control
9 underlayer not covered with the resist layer;
10 depositing a magnetic domain control film on the lateral side in the direction of
11 the track width of the multi-layered film and on the magnetic domain control underlayer on both
12 sides thereof;
13 depositing a dielectric film on the magnetic domain control film;
14 removing the resist layer; and
15 forming an upper magnetic film shield on the electrode film and the dielectric
16 film.

1 9. The method of manufacturing a magnetoresistive film of claim 6 or 7 or 8
2 wherein said removing includes milling.

1 10. The method of manufacturing a magnetoresistive film of claim 9 wherein said
2 milling is ion milling.